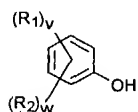


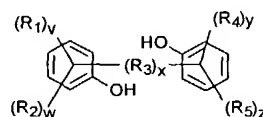
## CLAIMS

1. A magnetorheological fluid comprising:  
 10 to 14 weight percent of a hydrocarbon-based liquid;  
 86 to 90 weight percent of bimodal magnetizable particles;  
 0.05 to 0.5 weight percent fumed silica;  
 an additive package including a paraffin oil, a phenol and a  
 sulfide, wherein the phenol has one of a formula comprising:



Formula (IA)

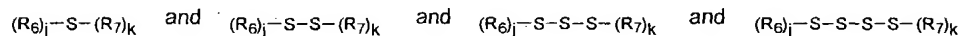
and



Formula (IB)

- and wherein in formulas (IA) and (IB) each of  $R_1$ ,  $R_2$ ,  $R_3$ ,  $R_4$ ,  
 and  $R_5$ , includes one of H,  $\text{CH}_3$ ,  $\text{C}_n\text{H}_{2n+2}$ ,  $\text{C}_n\text{H}_{2n+1}$ ,  $\text{C}_n\text{H}_{2n}$ ,  $\text{C}_n\text{H}_{2n-1}$ ,  $\text{C}_n\text{H}_{n+2}$ ,  
 $\text{C}_n\text{H}_{n+1}$ ,  $\text{C}_n\text{H}_n$ ,  $\text{C}_n\text{H}_{n-1}$ ,  $\text{C}_n\text{H}_{n-2}$ , HO,  $\text{CH}_3\text{O}_m$ ,  $\text{C}_n\text{H}_{2n+2}\text{O}_m$ ,  $\text{C}_n\text{H}_{2n+1}\text{O}_m$ ,  
 $\text{C}_n\text{H}_{2n}\text{O}_m$ ,  $\text{C}_n\text{H}_{2n-1}\text{O}_m$ ,  $\text{C}_n\text{H}_{n+2}\text{O}_m$ ,  $\text{C}_n\text{H}_{n+1}\text{O}_m$ ,  $\text{C}_n\text{H}_n\text{O}_m$ ,  $\text{C}_n\text{H}_{n-1}\text{O}_m$ ,  $\text{C}_n\text{H}_{n-2}\text{O}_m$ ,  
 $\text{C}_n\text{H}_{n-3}\text{O}_m$ ,  $\text{C}_n\text{H}_{n-4}\text{O}_m$ ,  $\text{C}_n\text{H}_{n-5}\text{O}_m$ , and  $\text{C}_n\text{H}_{n-6}\text{O}_m$ , wherein n is an integer from 1  
 to 24, and m is an integer from 1 to 6, and wherein each of v, w, x, y, and z  
 is an integer from 0 to 5; and

wherein the sulfide has one of a formula comprising:



Formula (IIA)

Formula (IIB)

Formula (IIC)

Formula (IID)

- and wherein in formulas (IIA), (IIB), (IIC), and (IID) each of  $R_6$   
 and  $R_7$ , includes one of H,  $\text{CH}_3$ ,  $\text{C}_n\text{H}_{2n+2}$ ,  $\text{C}_n\text{H}_{2n+1}$ ,  $\text{C}_n\text{H}_{2n}$ ,  $\text{C}_n\text{H}_{2n-1}$ ,  $\text{C}_n\text{H}_{2n+2}$ ,  
 $\text{C}_n\text{H}_{n+1}$ ,  $\text{C}_n\text{H}_n$ , and  $\text{C}_n\text{H}_{n-1}$  groups, wherein n is an integer from 1 to 24 and  
 wherein j and k is an integer from 2 to 24.

2. A magnetorheological fluid as set forth in claim 1 wherein the bimodal magnetizable particles consist essentially of:

a first group of particles having a first range of diameter sizes with a first mean diameter having a standard deviation no greater than about two-thirds of the value of said mean diameter and

a second group of particles with a second range of diameter sizes and a second mean diameter having a standard deviation no greater than about two-thirds of said second mean diameter,

such that the major portion of all particle sizes fall within the range of one to 100 microns and the weight ratio of said first group to said second group is in the range of 0.1 to 0.9, and the ratio of said first mean diameter to said second mean diameter is five to ten.

3. A fluid as recited in claim 1 in which said bimodal magnetizable particles comprise at least one of iron, nickel and cobalt.

4. A fluid as recited in claim 1 in which said bimodal magnetizable particles comprise carbonyl iron particles having a mean diameter in the range of one to ten microns.

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5. A fluid as set forth in claim 2 wherein the first and second groups of particles are of the same composition.

6. A fluid as set forth in claim 1 wherein the hydrocarbon-based liquid comprises a polyalphaolefin.

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7. A fluid as set forth in claim 1 wherein the hydrocarbon-based liquid comprises a homopolymer of 1-decene which is hydrogenated.

8. A fluid as set forth in claim 1 wherein the paraffin oil comprises molecules with a carbon chain having 20-60 carbon atoms therein.

9. A fluid as set forth in claim 1 wherein the phenol comprises  
5 2,4,6-bis(1,1-dimethyl ethyl)-phenol.

10. A fluid as set forth in claim 1 wherein the sulfide comprises di-t-butyl trisulfide.

10 11. A fluid as set forth in claim 1 wherein the additive package is present in a concentration ranging from 0.5 to 5 percent of the total liquid mass of the fluid.